# Met Office launches new suite of water supply models

3 September 2013 - The Met Office launches its first suite of water supply models, to assist water companies in managing water resource strategies and operations more proactively and efficiently.

The water supply models provide detailed weather dependent leakage, demand, burst and turbidity data.

Water demand, leakage, burst, seasonal night usage and turbidity have historically been difficult to quantify or forecast accurately across water company networks and resource zones, with a large weather dependency in all elements. Understanding this weather dependency enables accurate modelling and reporting of these components.

The launch follows a successful collaboration with Thames Water to make the suite of models available across the whole water industry. The models, which have been developed to include the Met Office's world leading weather data, can be adapted and calibrated to individual water company regions.

Michelle Spillar, Head of Utilities at the Met Office, said: "Historically, burst, leakage, demand and turbidity have been extremely difficult for water companies to predict accurately across water networks and resource zones. Our new modelling suite enables water companies to perform day by day network monitoring, forecast trends and analyse actual and predicted future events - offering multiple benefits and cost savings across water resources' strategy and operations.

"We will work with water companies to input relevant historic weather and network data and calibrate the models for specific network characteristics, to ensure the model is running optimally."

The Met Office's suite of models consists of:

### Burst model

- Increases in pipe burst occurrence during cold-weather winter periods cause large fluctuations in workload and resources required in call centre and repair teams.
- Understanding and modelling weather related pipe bursts enables prediction of likely burst numbers on a 15 day time scale, allows for optimal resource deployment.
- Integration of the burst model into contingency planning and emergency response, allows some of the worst impacts of winter weather to be modelled and quantified with mitigation activities planned.

### Leakage model

- Leakages account for up to 30% of the total annual distribution input across the water company's network.
- The Met Office's leakage prediction model assists by assessing and predicting the influence of weather on winter leakage, which is known to particularly increase in periods of winter weather.
- The benefits of the model include close management of weather related leakage, on a week by week basis. This allows the water company to constantly monitor and review the leakage strategy. Through understanding and modelling weather related leakage, an informed strategy to meet leakage targets can be implemented and expenditure on leakage reduction work can be set against levels of risk.

### Demand model

- Summer water demand can vary by up to 10% according to the weather.
- The Met Office's demand model can be used for long term strategic and short term operational demand modelling, prediction and water resource management.
- The model allows water companies to manage service reservoir storage levels optimally, providing efficiencies in energy use and security of supply during peak periods. Maintenance activities can be scheduled with increased confidence and assessment of the business benefits of implementing demand management measures, such as temporary use bans, can be undertaken accurately.

### Seasonal night usage model

- Night usage of water is known to increase in summer, in accordance with hot and dry weather conditions and other relevant factors.
- Separating additional summer night use and leakage is challenging for water companies.
- The seasonal night use model allows seasonal usage increases to be separated from leakage. Leakage trends across different resource zones over the summer can be monitored with the weather signal removed and leakage planners are able to use the seasonal night use model results to target detection resources effectively during the summer. Accurate assessments of true leakage early in the year, can benefit leakage targeting later in the year.

### Turbidity model

- The measurement of turbidity, the cloudiness or haziness of a fluid, is a key test of water quality.
- Heavy rainfall causes increases in the levels of suspended particles in rivers, increasing the level of treatment needed.
- The cost incurred in bringing the untreated water up to drinking water quality can increase the cost of production by up to five times.
- The turbidity model enables the relationship between heavy rainfall and turbidity to be modelled, helping manage resources and minimise the impact of high turbidity events.

Following successful pilots, the Met Office is looking for water companies to calibrate the burst, leakage, demand and season night use models to their region. Contact us to find out more.

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